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Studies on the Rocky Mountain flora—XXVIII

PER AXEL RYDBERG

FABACEAE

Thermopsis ovata (Robinson) Rydb.

Thermopsis montana ovata Robinson, Contr. U. S. Nat. Herb. **11**: 349. 1906.

This differs from *T. montana* not only in its broader leaflets (the only characters given in the original description) but in its spreading leaves, its large stipules, which in the lower leaves are ovate and very oblique, and in its elongate and lax raceme. It differs from *T. xylorrhiza* A. Nels. in its lax inflorescence and strictly straight pods.

Dr. S. Watson in publishing *Lupinus Kingii* described the plant as being perennial. This mistake of his led him as well as others astray, for he redescribed the same plant a few years later as an annual under the name *L. Sileri*. This fact has been called attention to several times and among other places, in my Flora of Colorado. It is, therefore, surprising that the error should be repeated by Coulter and Nelson in the New Manual of Botany of the Central Rocky Mountains, where the description begins: "From a perennial rootstock, dwarf, cespitose," etc., characters which in no way apply to the type in the Gray Herbarium nor to the duplicates in the herbaria of Columbia University and the United States National Museum. Furthermore, Coulter and

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Nelson give as a synonym under the same *Lupinus aduncus* Greene, which is the same as *L. argenteus argophyllus*, a plant of different habit.

The so-called *Lupinus rivularis* of the Columbia region and extending into Idaho should be known as *L. cytisoides* Agardh. Miss Alice Eastwood has seen the type of *L. rivularis* Dougl., which according to her belongs to an entirely different group from the plant called *L. rivularis* by Dr. Watson in his revision.

The following Lupines are to be added to the flora of the Rocky Mountains: *Lupinus nootkatensis* Donn has been collected in the Rockies of British Columbia and Alberta, *L. plumosus* Dougl. in Idaho and Utah, *L. minimus* Dougl. in Idaho and Alberta, *L. lepidus* Dougl. in Idaho, *L. Cusickii* S. Wats. in Idaho and Utah, and *L. micensis* Jones in Utah.

Lupinus lupinus Rydb. sp. nov.

Perennial with a woody caudex; stems 3–6 dm. high, densely strigose-canescent, sparingly branched; leaves numerous; stipules subulate, about 1 cm. long; petioles canescent, 5–8 cm. long; leaflets 7–9, oblanceolate, usually flat, 3–6 cm. long, appressed-canescent on both sides, less so above; peduncles about 1 dm. long; raceme 5–10 cm. long; bracts lanceolate, acute, 3–4 mm. long, silvery-pubescent, early deciduous; calyx silvery-pubescent, saccate at the base; upper lip scarcely 3 mm. long, the lower fully 5 mm.; corolla about 1 cm. long, dark blue or purple; banner orbicular, pubescent on the back, usually with a light spot in the center; keel strongly curved, rather broad, ciliate on the margins; pod densely villous, about 3 cm. long, mostly 3-seeded.

This is related to *L. argentinus*, *L. aduncus*, and *L. oreophilus*, but differs from the first in its grayish instead of silvery pubescence of the leaves, which are greener above and not conduplicate, and in its less spurred calyx; from *L. aduncus* in its broader leaves and the shorter upper lip of its calyx; and from *L. oreophilus* in its broader leaves and saccate calyx.

Along streams and in meadows at an altitude of 2,000–3,000 m.

UTAH: Western Bear's Ear, Elk Mountains, Aug. 2, 1911, *Rydberg & Garrett 9363* (type, in herb. N. Y. Bot. Gard.); also western slope of La Sal Mountains, July 6, *8595*, *8596*, and *8600;* meadow south of Monticello, July 24, *9167;* Head of Dry Wash,

Abajo Mountains, August 11, *9605;* Hammond Canyon, Elk Mountains, August 10, *9583*.

LOTUS TENUIS Waldst. & Kit.; Willd. Enum. Hort. Berol. 797. 1809

Lotus tenuifolius (L.) Reich. Fl. Germ. 506. 1830.
Lotus Macbridei A. Nels. Bot. Gaz. **53**: 221. 1912.

In looking over a collection received in exchange from the University of Wyoming, I found a specimen labeled *Lotus Macbridei* A. Nels. n. sp. To my surprise I found that this was a true *Lotus*, i. e. not belonging to any of the segregates of *Hosackia* but of the European type. As it would have been exceedingly strange if a species of *Lotus* in the restricted sense should be found native in America, I turned to our collection of Old World species of *Lotus* and found that it is the same as *L. tenuifolius* (L.) Reich. Before I had time to call Professor Nelson's attention to the fact, his description appeared in the Botanical Gazette.

Trifolium macrocephalum (Pursh) Piper, *T. plumosum* Dougl., *T. eriocephalum* Nutt., *T. spinulosum* Dougl., and *cyathiferum* Lindl. have been collected in Idaho; *T. Rusbyi* Greene and *Medicago hispida* Gaertner (*M. denticulata* Willd.) in Montana.

ACMISPON Raf. New Flora **1**: 53. 1836

I think that this genus should be restored. The *Microlotus* section sometimes referred to *Hosackia*, sometimes to *Lotus*, is out of place in either genus, and *Acmispon* is the oldest available generic name.

Acmispon americanus (Nutt.) Rydb.

Lotus sericeus Pursh, Fl. Am. Sept. 489. 1814. Not *L. sericeus* DC. 1813.
Trigonella americana Nutt. Gen. **2**: 120. 1818.
Hosackia Purshiana Benth. Bot. Reg. under *pl. 1257*. 1829.
Acmispon sericeum Raf. New Fl. **1**: 53. 1836.
Lotus americanus Bisch. Del. Sem. Hort. Heidelb. 1839.
Trigonella sericea Eat. & Wright, N. Am. Bot. Ed. 8, 459. 1840.

Acmispon elatus (Nutt.) Rydb.

Hosackia elata Nutt.; T. & G. Fl. 1: 327. 1838.

The former of the two species is common on the plains from Minnesota to Arkansas, Sonora, and Idaho; the latter is found in Washington, Oregon, and Idaho. A few more species are found in California.

Psoralea stenostachys Rydb. sp. nov.

Perennial with a horizontal rootstock; stem adsurgent or erect, branched, sparingly strigose and glandular-dotted, 3–5 dm. high; leaves digitately 3-foliolate; leaflets oblanceolate, 2–4 cm. long, from rounded to acute at the base, mucronate at the apex, sparingly strigose and conspicuously glandular-punctate; peduncles 5–15 cm. long; racemes elongate, many-flowered and lax: calyx densely white-strigose; tube 1.5 mm. long; teeth 0.5 mm. long, lanceolate or lance-ovate, acute; corolla white, 4 mm. long; pod densely white-hairy.

This species is related to *P. lanceolata* Pursh and *P. Purshii* Vail, but differs from both in the elongate racemes and the acute calyx-lobes; from the former it differs also in the hairy pod, and from the latter in the narrower leaflets. It grows on sandy soil at an altitude of about 1,300–1,500 m.

UTAH: Government Well, Toole County, June 7, 1900, *M. E. Jones 6221* (type, in herb. N. Y. Bot. Gard.); Utah, July 2, 1888, *M. E. Jones 1833*.

Psoralea stenophylla Rydb. sp. nov.

Perennial with a horizontal rootstock; stem simple, about 5 dm. high, slender, sparingly strigose and glandular-punctate; leaves digitately 3-foliolate or the lower 5-foliolate; leaflets narrowly linear, 2.5–5 cm. long, about 2 mm. wide, glandular-punctate and sparingly strigose; stipules linear, 5–8 mm. long; petioles about 3 cm. long; peduncles 8–10 cm. long; racemes elongate, 5 cm. long or longer, lax; pedicels usually longer than the calyx; calyx sparingly strigose, conspicuously punctate; lobes triangular, acute, 0.5 mm. long; corolla about 4 mm. long; fruit not seen.

This has the narrow leaflets of *Psoralea micrantha*, but the raceme is elongate and the sepals are acute as in the preceding species, from which it differs in the very narrow leaflets. If it has the densely hairy pod of that species and *P. Purshii*, it cannot be told from the material, but the young ovaries do not indicate

such a character. It grows on sandy river banks at an altitude of about 1,600 m.

UTAH: Proposed dam site, near Wilson Mesa, Grand County, July 1, 1911, *Rydberg & Garrett 8367* (type, in herb. N. Y. Bot. Gard.).

Psoralea juncea Eastw. was described as being leafless, the leaves being reduced to scales. This is true as far as the stem-leaves are concerned. The basal leaves, which soon wither away, are digitately 3–5-foliolate with lanceolate leaflets, 2–3 cm. long, grayish, strigose and strongly veiny.

Psoralea obtusiloba Torrey has been collected in Colorado by Tweedy.

Parosela polydenia (Torr.) Heller, *P. Fremontii* (Torr.) Vail, *P. Johnsoni* (S. Wats.) Vail, and *P. amoena* (S. Wats.) Vail have been collected in southern Utah.

Phaca ampullaria (S. Wats.) Rydb.

Astragalus ampullarius S. Wats. Am. Nat. **7**: 300. 1873.

Phaca Wardii (A. Gray) Rydb.

Astragalus Wardii A. Gray, Proc. Am. Acad. **12**: 55. 1877.

Phaca subcinerea (A. Gray) Rydb.

Astragalus subcinereus A. Gray, Proc. Am. Acad. **13**: 366. 1878.

Phaca Cusickii (A. Gray) Rydb.

Astragalus Cusickii A. Gray, Proc. Am. Acad. **13**: 370. 1878.

Phaca sabulonum (A. Gray) Rydb.

Astragalus sabulonum A. Gray, Proc. Am. Acad. **13**: 368. 1878.

Phaca Preussii (A. Gray) Rydb.

Astragalus Preussii A. Gray, Proc. Am. Acad. **6**: 222. 1864.

Phaca serpens (M. E. Jones) Rydb.

Astragalus serpens M. E. Jones, Proc. Cal. Acad. II. **5**: 641. 1895.

Phaca Silerana (M. E. Jones) Rydb.

Astragalus Sileranus M. E. Jones, Zoe **2**: 242. 1891.

Phaca jejuna (S. Wats.) Rydb.

Astragalus jejunus S. Wats. Bot. King Exped. 73. 1871.

Phaca leptalea (A. Gray) Rydb.

Phaca pauciflora Nutt.; T. & G. Fl. N. Am. 1: 348, 1838. Not *P. pauciflora* Pers. 1806.

Astragalus leptaleus A. Gray, Proc. Am. Acad. 6: 220. 1864.

Phaca artemisiarum (M. E. Jones) Rydb.

Astragalus Beckwithii purpureus M. E. Jones, Zoe 3: 288. 1893. Not *A. purpureus* Lam. 1783.

Astragalus artemisiarum M. E. Jones, Zoe 4: 369. 1894.

Phaca pubentissima (T. & G.) Rydb.

Astragalus multicaulis Nutt.; T. & G. Fl. N. Am. 1: 335. 1838. Not *A. multicaulis* Ledeb. 1831.

Astragalus pubentissimus T. & G. Fl. N. Am. 1: 693. 1840.

Mr. Sheldon placed this between *Astragalus crescenticarpus* and *A. cibarius*, two species of *Xylophacos;* its pod is that of a *Phaca.*

Phaca sesquiflora (S. Wats.) Rydb.

Astragalus sesquiflorus S. Wats. Proc. Am. Acad. 10: 346. 1875.

Mr. Sheldon associated this erroneously with *Astragalus vexilliflexus* and other species of *Homalobus.* It is a true *Phaca.*

Xylophacos cuspidocarpus (Sheld.) Rydb.

Astragalus cuspidocarpus Sheld. Minn. Bot. Stud. 1: 147. 1894.

Xylophacos cibarius (Sheld.) Rydb.

Astragalus cibarius Sheld. Minn. Bot. Stud. 1: 149. 1894.

Astragalus arietinus M. E. Jones, Proc. Calif. Acad. II. 5: 653. 1895.

Xylophacos puniceus (Osterh.) Rydb.

Astragalus puniceus Osterh. Muhlenbergia 1: 140. 1906.

Xylophacos Zionis (M. E. Jones) Rydb.

Astragalus Zionis M. E. Jones, Proc. Calif. Acad. II. 5: 652. 1895.

Xylophacos argophyllus (Nutt.) Rydb.

Astragalus argophyllus Nutt.; T. & G. Fl. N. Am. 1: 331. 1838.

Xylophacos cymboides (M. E. Jones) Rydb.

Astragalus cymboides M. E. Jones, Proc. Calif. Acad. II. 5: 650. 1895.

Xylophacos musinensis (M. E. Jones) Rydb.

Astragalus musinensis M. E. Jones, Proc. Calif. Acad. II. 5: 671. 1895.

Xylophacos consectus (Sheld.) Rydb.

Astragalus consectus Sheld. Minn. Bot. Stud. 1: 143. 1894.

Xylophacos Watsonianus (Kuntze) Rydb.

Astragalus eriocarpus S. Wats. Bot. King Exped. 71. 1871. Not *A. eriocarpus* DC. 1802.

Tragacantha Watsoniana Kuntze, Rev. Gen. Pl. 2: 942. 1891.

Astragalus Watsonianus Sheld. Minn. Bot. Stud. 1: 144. 1894.

Xylophacos utahensis (Torr.) Rydb.

Phaca mollissima utahensis Torr. Stansb. Exped. 385. 1852.

Astragalus utahensis T. & G. Pac. R. Rep. 2: 120. 1855.

Xylophacos inflexus (Dougl.) Rydb.

Astragalus inflexus Dougl. in G. Don, Gen. Syst. 2: 256. 1832.

Tium eremiticum (Sheld.) Rydb.

Astragalus eremiticus Sheld. Minn. Bot. Stud. 1: 161. 1894.

Tium atropubescens (Coult. & Fish.) Rydb.

Astragalus atropubescens Coult. & Fish. Bot. Gaz. 18: 300. 1893.

Astragalus Kelseyi Rydb. Mem. N. Y. Bot. Gard. 1: 241. 1900.

Tium arrectum (A. Gray.) Rydb.

Astragalus arrectus A. Gray, Proc. Am. Acad. 8: 289. 1873.

Astragalus Leibergii M. E. Jones, Proc. Calif. Acad. II. 5: 663. 1895.

Astragalus palousiensis Piper, Bot. Gaz. 22: 489. 1896.

Hamosa calycosa (Torr.) Rydb.

Astragalus calycosus Torr. in S. Wats. Bot. King Exped. 66. 1871.

Ctenophyllum Grayi (Parry) Rydb.

Astragalus Grayi Parry; Wats. Am. Nat. **8**: 212. 1874.

Cystium platytropis (A. Gray) Rydb.

Astragalus platytropis A. Gray, Proc. Am. Acad. **6**: 526. 1865.

Cystium Coulteri (Benth.) Rydb.

Astragalus Coulteri Benth. Pl. Hartw. 307. 1848.

Cystium ineptum (A. Gray) Rydb.

Astragalus ineptus A. Gray, Proc. Am. Acad. **6**: 525. 1865.

Cystium lentiginosum (Dougl.) Rydb.

Astragalus lentiginosus Dougl.; Hook. Fl. Bor.-Am. **1**: 151. 1831.

Cystium araneosum (Sheld.) Rydb.

Astragalus araneosus Sheld. Minn. Bot. Stud. **1**: 170. 1894.

Cystium boiseanum (A. Nels.) Rydb.

Astragalus boiseanus A. Nels. Bot. Gaz. **53**: 223. 1912.

Atelophragma lineare Rydb. sp. nov.

Homalobus aboriginum Rydb. Bull. N. Y. Bot. Gard. **2**: 176, in part. 1901.

Perennial with a woody taproot and short cespitose caudex; stem grayish strigose, often tinged with purple, 2–4 dm. high; stipules ovate or lanceolate, acute, 2–4 mm. long; leaves 5–6 cm. long; leaflets 9–15, linear, 1–2 cm. long, 1–2 mm. wide, grayish strigose; peduncles 5–10 cm. long; raceme 2–3 cm. long, in fruit 6 cm. long; calyx densely black-hairy; tube 3 mm. long; teeth subulate, 2 mm. long; corolla about 8 mm. long, ochroleucous or tinged with purple; keel tipped with dark purple; legume glabrous, stipitate; stipe 4–5 mm. long; body 25–28 mm. long, convexly curved on both sutures, but much more strongly so on the upper; the partial partition very narrow.

This is related to *A. glabriusculum* (A. Gray) Rydb. and *A. aboriginum* (Richardson) Rydb., but differs from the former in the

grayish pubescence of the leaves, which are strigose instead of villous, and from both in the form of the pod. In both the lower suture of the pod is straight or slightly concavely curved.

YUKON TERRITORY: Foot of Lake Lebarge, 1899, *J. B. Tarleton 34b* (type, in herb. N. Y. Bot. Gard.); Dry Gulch, 1899, *Gorman 1014*.

ALBERTA: Rocky Mountains, 1857–1859, *Bourgeau*.

Atelophragma Forwoodii (S. Wats.) Rydb.

Astragalus Forwoodii S. Wats. Proc. Am. Acad. **25**: 129. 1890.

Sheldon places this species in the *Homalobus*, but it is closely related to *Atelophragma aboriginum* and *A. glabriusculum*.

Atelophragma glabriusculum (Hook.) Rydb.

Phaca glabriuscula Hook. Fl. Bor.-Am. **1**: 144. 1831.

Atelophragma ibapense (M. E. Jones) Rydb.

Astragalus ibapense M. E. Jones, Zoe **3**: 290. 1893.

Atelophragma Arthuri (M. E. Jones) Rydb.

Astragalus Arthuri M. E. Jones, Cont. West. Bot. **8**: 20. 1898.

Onix Mulfordae (M. E. Jones) Rydb.

Astragalus Mulfordae M. E. Jones, Cont. West. Bot. **8**: 18. 1898.

This species is the only representative in America of a group of plants segregated from *Astragalus* by Medicus. The other representatives are Asiatic. *Onix* is related to *Cystium* in having a membranous inflated 2-celled pod, but the pod is triangular in cross-section, the upper suture being acute and the lower more or less sulcate.

Microphacos parviflorus (Pursh) Rydb.

Dalea parviflora Pursh, Fl. Am. Sept. 474. 1814.
Astragalus gracilis Nutt. Gen. **2**: 100. 1818.
Phaca parviflora Nutt.; T. & G. Fl. N. Am. **1**: 348. 1838.

Diholcos scobinatulus (Sheld.) Rydb.

Astragalus Haydenianus major M. E. Jones, Zoe **2**: 241. 1891.
Astragalus Haydenianus nevadensis M. E. Jones, Zoe **2**: 241. 1891.
Astragalus scobinatulus Sheld. Minn. Bot. Stud. **1**: 24. 1894.

Phacopsis scaphoides (M. E. Jones) Rydb.

Astragalus arrectus scaphoides M. E. Jones, Proc. Calif. Acad. II. **5**: 664. 1895.

Cnemidophacos confertiflorus (A. Gray) Rydb.

Astragalus confertiflorus A. Gray, Proc. Am. Acad. **13**: 368. 1878.

Cnemidophacos argillosus (M. E. Jones) Rydb.

Astragalus argillosus M. E. Jones, Zoe **2**: 241. 1891.

Cnemidophacos reventoides (M. E. Jones) Rydb.

Astragalus reventoides Jones, Proc. Calif. Acad. II. **5**: 661. 1895.

Cnemidophacos reventus (A. Gray) Rydb.

Astragalus reventus A. Gray, Proc. Am. Acad. **15**: 46. 1880.

Kentrophyta tegetaria (S. Wats.) Rydb.

Astragalus tegetarius S. Wats. Bot. King Exped. 76. 1871.

Homalobus lingulatus (Sheld.) Rydb.

Astragalus lingulatus Sheld. Minn. Bot. Stud. **1**: 118. 1894.

Homalobus exilifolius (A. Nels.) Rydb.

Astragalus exilifolius A. Nels. Bull. Torrey Club **26**: 10. 1899.

Homalobus simplicifolius (Nutt.) Rydb.

Phaca simplicifolia Nutt.; T. & G. Fl. N. Am. **1**: 350. 1838.
Astragalus simplicifolius A. Gray, Proc. Am. Acad. **6**: 231. 1864.

Homalobus lancearius (A. Gray) Rydb.

Astragalus lancearius A. Gray, Proc. Am. Acad. **13**: 370. 1878.

Homalobus miser (Dougl.) Rydb.

Astragalus miser Dougl.; Hook. Fl. Bor.-Am. **1**: 153. 1831.

Homalobus Dodgeanus (M. E. Jones) Rydb.

Astragalus Dodgeanus M. E. Jones, Zoe **3**: 289. 1893.

Mr. Sheldon placed this next to *Astragalus glabriusculus* (Hook.) Gray, but its pod has not a trace of a partition and the plant is a true *Homalobus*, not an *Atelophragma*.

Homalobus debilis (Nutt.) Rydb.

Phaca debilis Nutt.; T. & G. Fl. N. Am. **1**: 345. 1838.
Astragalus debilis A. Gray, Proc. Acad. Sci. Phila. 1863: 60. 1864.

Homalobus strigosus (Coult. & Fish.) Rydb.

Astragalus strigosus Coult. & Fish. Bot. Gaz. **18**: 299. 1893.
Astragalus griseopubescens Sheld. Minn. Bot. Stud. **1**: 24. 1894.

Homalobus episcopus (S. Wats.) Rydb.

Astragalus episcopus S. Wats. Proc. Am. Acad. **10**: 346. 1875.

Homalobus collinus (Dougl.) Rydb.

Phaca collina Dougl.; Hook. Fl. Bor.-Am. **1**: 141. 1831.
Astragalus collina Dougl.; G. Don, Gen. Syst. **2**: 256. 1832.

Aragallus Bigelovii (A. Gray) Rydb.

Oxytropis Lambertii Torr. Pac. R. Rep. **4**: 80. 1857. Not *O. Lambertii* Pursh. 1814.
Oxytropis Lambertii Bigelovii A. Gray, Proc. Am. Acad. **20**: 7. 1885.

Aragallus plattensis (Nutt.) Rydb.

Oxytropis plattensis Nutt.; T. & G. Fl. N. Am. **1**: 340. 1838.

Lathyrus graminifolius White and *L. Torreyi* A. Gray have been collected in southern Utah; *L. Nuttallii* S. Wats. and *L. obovatus* White in Idaho.

EUPHORBIACEAE

Chamaesyce Parryi (Engelm.) Rydb.

Euphorbia Parryi Engelm. Am. Nat. **9**: 350. 1875.
This has been collected in southern Utah.

Chamaesyce exstipulata (Engelm.) Rydb.

Euphorbia exstipulata Engelm. Bot. Mex. Bound. Surv. 189. 1859.
Euphorbia Aliceae A. Nels. Bot. Gaz. **42**: 50. 1906.
This has been collected as far north as Wyoming.

ACERACEAE

NEGUNDO (Ray) Ludwig-Boehmer, Def. Pl. 508. 1760

Professor Nieuwland in the American Midland Naturalist* discussed the North American species of box-elder. He used the name *Rulac*, believing in a pre-Linnaean priority for genera. As both the Vienna Rules and the American Code have adopted 1753 as the starting point for botanical nomenclature, few will follow him in the names adopted. If our box-elders are regarded as generically distinct from the maples, we must use the name *Negundo*. Professor Nieuwland recognizes six species. I think there should be recognized eight species in North America. The Texan form, *Rulac californica texana* Pax, is well distinct from *Negundo californicum*, Professor Nieuwland having overlooked the difference in the fruit, which in the Texan species agrees more with our eastern box-elder and was included in it by Dr. Britton. The following key was prepared by me over two years ago and two new species were named in manuscript. One of these has been described by Professor Nieuwland under the name *Rulac Nuttallii;* a description of the other is given below. I publish here the key, as several of the characters have not been pointed out by Professor Nieuwland.

Branches of the season glabrous or with a few scattered appressed hairs; anthers acute, tapering into a tip ¼–⅓ mm. long, formed by the produced connective (in the first species unknown).
- Fruiting pedicels glabrous, the lower 5–8 cm. long, very slender: fruit glabrous, contracted below into a short stipe. 1. *N. orizabense.*
- Fruiting pedicels sparingly pilose: the lower 2–3 cm. long.
  - Ovary and fruit finely pubescent; the latter sometimes becoming glabrate in age, distinctly constricted below into a narrow stipe-like base; leaflets broad, toothed, rarely lobed. 2. *N. Negundo.*
  - Ovary and fruit glabrous; the latter slightly or usually not at all constricted below; leaflets usually lobed, with hair-tufts in the axils of the veins. 3. *N. Nuttallii.*

Branches of the season densely velutinous with short spreading hairs; anthers obtuse, merely mucronate.
- Leaflets coarsely dentate or lobed; style evident but short.
  - Fruit distinctly constricted at the base into a short stipe, densely and minutely pubescent; leaflets

* Vol. 2: 129–140. 1911.

broadly oval, short-acuminate, usually merely dentate; the lateral ones often oblique at the base. 4. *N. texanum*

Fruit not at all or slightly constricted at the base; leaflets lanceolate, ovate or obovate, or the terminal one rhombic, long-acuminate, usually more or less lobed.

Fruit glabrous or with a few scattered hairs, similar to those of the pedicels; mucro of the anthers minute or obsolete; leaflets glabrate above in age.

Racemes seldom more than 1 dm. long; wings scarcely at all decurrent on the body of the fruit. 5. *N. interius.*

Racemes in fruit 1.5–2 dm. long; wings decurrent on the body of the fruit almost to the bottom of the sinus. 6. *N. Kingii.*

Fruit densely puberulent; mucro of the anthers more distinct, nearly ¼ mm. long; leaflets densely pubescent on both sides. 7. *N. californicum.*

Leaflets sharply and evenly serrate except towards the base; style obsolete. 8. *N. mexicanum.*

1. **Negundo orizabense** Rydb. sp. nov.

A tree with glabrous, brownish twigs; leaves 3-foliolate; pedicels slender, glabrous, 5–10 cm. long; leaflets thin, glabrous or with a few scattered hairs on the ribs below, acuminate at both ends, serrate above the middle, with broadly ovate teeth directed forward and mucronate; the terminal leaflet rhombic-oval, 5–10 cm. long, with petiolules 1–2 cm. long; the lateral ones lanceolate, oval or oblanceolate, short-petioluled; racemes in fruit 2 dm. long or more, the pedicels very long and slender, the lower 5–8 cm. long; samaras ascending, glabrous; body oblong, about 1 cm. long and 4 mm. wide, acute but not constricted at the base, with one strong and several weak longitudinal veins; wing about 2 cm. long and nearly 1 cm. wide, somewhat incurved above, not decurrent on the body.

MEXICO: Orizaba, 1853 and 1855, *Fred. Müller* (type, in herb. Columbia University).

2. **Negundo Negundo** (L.) Karsten, Deuts. Fl. 596. 1880–3*

DISTRIBUTION: From Ontario and Vermont to Georgia, Missouri and Illinois.

3. **Negundo Nuttallii** (Nieuwl.) Rydb.

Acer fraxinifolium Nuttall, Gen. N. Am. 1: 253. 1818. Not *Negundium fraxinifolium* Raf. 1808.

* For other synonyms see Nieuwland, American Midland Naturalist 2: 136. 1911.

Rulac Nuttallii Nieuwl. Am. Midl. Nat. 2: 137. 1911.

DISTRIBUTION: From Michigan and Ohio (?) to Kansas, Colorado and Montana.

4. **Negundo texanum** (Pax) Rydb.

Acer Negundo texanum Pax; Bot. Jahrb. 7: 212. 1886.
Acer californicum texanum Pax; Bot. Jahrb. 11: 75. 1889.
Rulac texana Small, Fl. SE. U. S. 743. 1903.

DISTRIBUTION: Texas and Oklahoma.

5. **Negundo interius** (Britton) Rydb.

Rulac texana Small, Fl. SE. U. S. 743, in part. 1903. Not *Acer texanum* Pax. 1886.
Acer interior Britton, N. Am. Trees 655. 1908.

DISTRIBUTION: From Saskatchewan and Manitoba to Nebraska, New Mexico, Arizona and Montana. Nieuwland gives *Negundo Fraxinus* Bourgeau* as a synonym under this. At the place referred to Bourgeau enumerates a number of genera collected on May 6. Evidently a comma is omitted between *Negundo* and *Fraxinus*.

6. **Negundo Kingii** (Britton) Rydb.

Acer Kingii Britton, N. Am. Trees 656. 1908.
Rulac Kingii Nieuwl. Am. Midl. Nat. 2: 139. 1911.

DISTRIBUTION: Utah and Arizona.

7. NEGUNDO CALIFORNICUM T. & G. Fl. N. Am. 1: 250. 1838

Acer californicum Dietr. Syn. 2: 1283. 1840.
Rulac californica Nieuwl. Am. Midl. Nat. 2: 139. 1911.

DISTRIBUTION: California and according to Nieuwland extending into northern Mexico.

8. NEGUNDO MEXICANUM DC. Prod. 1: 546. 1824

Acer mexicanum Pax; Bot. Jahrb. 7: 212. 1886. Not *Acer mexicanum* A. Gray. 1861.
Rulac mexicana Nieuwl. Am. Midl. Nat. 2: 140. 1911.

DISTRIBUTION: Southern Mexico to Guatemala.

* Journ. Linn. Soc. 4: 9. 1859.

RHAMNACEAE

Rhamnus betulaefolia Greene is to be added to the flora; it was collected in southeastern Utah in the summer of 1911 by Professor Garrett and myself.

MALVACEAE

Dr. Greene* in segregating *Eremalche* from *Malvastrum* made this statement: "and that there exists so much as one real *Malvastrum* north of the Mexican border, I hold to be doubtful."

A little investigation in the history of the genus would show that this statement is untenable. It is evident that Dr. Gray did not base his conception of the genus *Malvastrum* on the section *Malvastrum* of *Malva* of De Candolle, for this section contains the typical species of *Malva* also.

The first subsection of this section of De Candolle's is *Chrysanthae*, and some species of this subsection must be regarded as the type of *Malva* section *Malvastrum* DC. Of this subsection Dr. Gray remarked: "If the yellow flowered species with a somewhat different habit and usually a manifest persistent involucre, which forms a second section (the *Chrysanthae* DC., etc.), are correctly referred to this genus, it will comprise a large number of species from tropical and South America, which need an elaborate revision. I enumerate below merely the North American species which are known to me." Furthermore, Dr. Gray did not include in his genus a single species of *Malva* given by De Candolle. This shows that Dr. Gray based his genus on the North American species and in publishing the genus he gave the name as "MALVASTRUM *Nov. Gen.*," without citing De Candolle's section, although he had referred to it a few pages before in a footnote under *Callirrhoe*. As the type of the genus *Malvastrum*, therefore, we must desigate the first given binomial under *Malvastrum*, which is *M. coccineum*. Of the other species included in the original publication *M. Fremontii* Torr., *M. Wrightii* A. Gray, *M. grossulariaefolium* (Hook.) A. Gray, *M. angustum* A. Gray, *M. Munroanum* (Dougl.) Gray, and *M. spicatum* (L.) Gray are plants of the United States. I agree with Dr. Greene that *M. rotundifolium* A. Gray and *M. exile* A. Gray should not be included in *Malvas-*

* Leaflets 1: 207. 1906.

trum; but I believe that that genus should be merged in *Sphaeralcea*. *Malvastrum coccineum*, the type of the genus, has the habit of the typical species of *Sphaeralcea*. The fruit is also the same except that the empty non-reticulate portion of the carpel is much reduced. *M. grossulariaefolium* and *M. Munroanum* with little more developed upper portions have been tossed back and forth between the genera *Malvastrum* and *Sphaeralcea*. Six species should be transferred from *Malvastrum* to *Sphaeralcea* under the following names.

Sphaeralcea grossulariaefolia (H. & A.) Rydb.

(?) *Malva Creeana* Graham, Bot. Mag. *pl. 3698*. 1838.
Sida grossulariaefolia Hook. & Arn. Bot. Beech. Voy. 326. 1841.
Malvastrum grossulariaefolium A. Gray, Mem. Am. Acad. 4: 21. 1849.
Sphaeralcea pedata Torr. Mem. Am. Acad. 4: 23. 1849.
Malvastrum coccineum grossulariaefolium Torr. Stansb. Exped. 384. 1852.

Sphaeralcea dissecta (Nutt.) Rydb.

Sida dissecta Nutt.; T. & G. Fl. N. Am. 1: 235. 1838.
Malvastrum coccineum dissectum A. Gray, Pl. Wright. 1: 17, in part. 1852.

Sphaeralcea coccinea (Nutt.) Rydb.

Malva coccinea Nutt. Fras. Cat. 1813.
Cristaria coccinea Pursh, Fl. Am. Sept. 454. 1814.
Sida coccinea DC. Prod. 1: 465. 1824.
Malvastrum coccineum A. Gray, Mem. Am. Acad. 4: 21. 1849.

Sphaeralcea elata (E. G. Baker) Rydb.

Malvastrum coccineum elatum E. G. Baker, Jour. Bot. 29: 171. 1891.
Malvastrum elatum A. Nels. Bot. Gaz. 34: 25. 1902.

Sphaeralcea digitata (Greene) Rydb.

Malvastrum coccineum dissectum A. Gray, Pl. Wright. 1: 17, in part. 1852.
Sphaeralcea pedata angustiloba A. Gray, Proc. Am. Acad. 22: 292. 1887.

Malvastrum digitatum Greene, Leaflets 1: 154. 1905.
Malvastrum dissectum Cockerell, Bull. Torrey Club 27: 87, mainly. 1900.
Malvastrum Cockerellii A. Nels. Bot. Gaz. 34: 24. 1902.
Malvastrum dissectum Cockerellii A. Nels.; Coult. & Nels. New Man. Bot. Cent. Rocky Mts. 318. 1909.

Sphaeralcea leptophylla (A. Gray) Rydb.

Malvastrum leptophyllum A. Gray, Pl. Wright. 1: 17. 1852.

Sphaeralcea arizonica Heller, sp. nov.

Perennial with a woody caudex branching from the base; leaf-blades reniform to cordate, 3–5 cm. long, densely stellate on both sides, obscurely lobed and crenate; inflorescence paniculate, dense, with short branches; calyx densely stellate throughout; its lobes ovate, acute, about 3 mm. long; petals pink, about 1 cm. long; carpels about 4 mm. long and 1.5 mm. wide, mucronate or short-cuspidate, oblong, only about the lowest fourth reticulate.

Differing from *S. ambigua* in the short calyx-lobes and the narrow and dense inflorescence and from *S. marginata* in the dense stellate pubescence, which extends even to the calyx.

ARIZONA: Flagstaff, June 16, 1898, *MacDougal 120* (type, in herb. N. Y. Bot. Gard.); 30 miles east of Flagstaff, July 18, 1893. *Wooton;* Fort Verde, May 4, 1888, *Mearns 225;* same locality 1887, *150*; Holbrook, June 18, 1901, *L. F. Ward;* Ash Fork, June 10, 1883, *Rusby 538.*

UTAH: St. George, Apr. 14, 1880, *M. E. Jones 1660;* proposed dam site, near Wilson Mesa, Grand Co., July 1, 1911, *Rydberg & Garrett 8386;* S. Utah, 1877, *Palmer;* 1874, *Parry 25.*

Sphaeralcea subrhomboidea Rydb. sp. nov.

Perennial with a woody caudex, branched at the base; stems stellate, 2–4 dm. high; leaf-blades rhombic in outline, 2–5 cm. long, stellate but not densely so, grayish-green, cuneate at the base, 5-ribbed, 3-cleft about half way down, the divisions 2–4-lobed; inflorescence a dense virgate panicle; calyx densely stellate, 4–5 mm. long; lobes broadly ovate, obtusish; corolla scarlet, 8–9 mm. long; fruit depressed-globose; carpels nearly round, obtuse, the lower half reticulate on the faces; seed solitary, without filiform attachment.

Nearest related to *S. grossulariaefolia* but the leaf-blades are rhombic in outline and cleft only half way down, and the terminal lobe is decidedly acute. On account of the leaf-form it may be mistaken for *S. Munroana*, but the flowers are smaller, the leaves more deeply divided, the fruit is smaller, the carpels less reniform, and the seed without filiform attachment.

UTAH: Wahsatch County, near Midway, July 6, 1905, *Carlton & Garrett 6691* (type, in herb. N. Y. Bot. Gard.); Fish Lake, around Twin Creeks, Aug. 8, 1905, *Rydberg & Carlton 7627*.

There is a group of plants in *Sphaeralcea*, however, which differs from the rest not only in habit but also in the character of the fruit. The carpels are not, as in the typical *Sphaeralcea*, divided into a lower portion, reticulate on the faces and enclosing the seeds, and an upper smooth and empty portion; the whole carpel is in this group smooth and hirsute. Dr. Greene* took out this group and made a new genus under the name of *Illiamna*. I think that this was unnecessary, for the plants are evidently cogeneric with the West Indian *Phymosia*, usually also merged in *Sphaeralcea*. If the two genera should be merged, the name for the genus would be *Phymosia*, for it is the older of the two. The species to be renamed under *Phymosia* are the following:

Phymosia acerifolia (Nutt.) Rydb.

Sphaeralcea acerifolia Nutt.; T. & G. Fl. N. Am. 1: 228. 1838.
Illiamna acerifolia Greene, Leaflets 1: 206. 1906.

Phymosia rivularis (Dougl.) Rydb.

Malva rivularis Dougl.; Hook. Fl. Bor.-Am. 1: 107. 1831.
Sphaeralcea rivularis Torr. in Gray, Mem. Am. Acad. 4: 23. 1849.
Illiamna rivularis Greene, Leaflets 1: 206. 1906.

Phymosia grandiflora Rydb.

Sphaeralcea grandiflora Rydb. Bull. Torrey Club 31: 565. 1904.
Illiamna angulata Greene, Leaflets 1: 206. 1906.

Phymosia Crandallii Rydb.

Sphaeralcea Crandallii Rydb. Bull. Torrey Club 31: 564. 1904.

* Leaflets 1: 205–207. 1906.

Phymosia longisepala (Torr.) Rydb.

Sphaeralcea longisepala Torr. Bot. Wilkes Exped. 255. 1874.

LOASACEAE

Nuttallia* humilis (A. Gray) Rydb.

Mentzelia multiflora humilis A. Gray, Pl. Wright 1: 74. 1852.
Touterea humilis Rydb. Bull. Torrey Club 30: 277. 1903.

Nuttallia integra (M. E. Jones) Rydb.

Mentzelia multiflora integra M. E. Jones, Proc. Calif. Acad. II. 5: 689. 1895.
Touterea integra Rydb. Fl. Colo. 235. 1906.

Nuttallia Rusbyi (Wooton) Rydb.

Mentzelia Rusbyi Wooton, Bull. Torrey Club 25: 261. 1898.
Touterea Rusbyi Rydb. Bull. Torrey Club 30: 276. 1903.

Nuttallia lobata Rydb. sp. nov.

Perennial with a thick root; stems strict, glabrous or nearly so, white and shining, 3–4 dm. high; leaves 5–8 cm. long, 5–8 mm. wide, narrowly oblanceolate, sinuately toothed or lobed with short triangular lobes; sepals lanceolate, acuminate, 8–10 mm. long; flowers diurnal, subtended by narrowly linear bracts; petals golden yellow, spatulate, obtuse, 12–18 mm. long; petaloid staminodia similar and almost as large; filaments numerous, the outer dilated; capsule 15 mm. long, 8–9 mm. thick, acute, almost turbinate at the base; seeds suborbicular, broadly winged.

This species is related to *N. multiflora* (Nutt.) Greene and *N. pterosperma* (Eastwood) Greene. It differs from the former in the narrow merely toothed or lobed not pinnatifid leaves; from the latter in the acute teeth or lobes of the leaves and the capsule, which is acute not rounded at the base, and from both in the glabrous stem.

UTAH: Near St. George, 1877, *Palmer 172* (type, in herb. Columbia Univ.); 1874, *Parry 76;* 1902, *Goodding 776.*

Nuttallia acuminata Rydb. sp. nov.

Stout biennial; stem 3–10 dm. high, straw-color, white in age, rather dull, densely villous with barbed hairs; lower leaves

* "*Nuttallæ*" Rafin. Am. Mo. Mag. (1818): 175. 1818; "*Nuttallia*", Greene. Leaflets 1: 209. 10 Ap. 1906.

oblanceolate, 1–2 dm. long, sinuately dentate, densely scabrous with triangular teeth; upper stem-leaves lanceolate, long-acuminate, pinnatifid with lanceolate or rarely triangular lobes, the lower ones of which are usually large and salient, the base of the leaves, therefore, being very broad and truncate; flowers diurnal; their bracts narrowly linear, entire or with a few narrow lobes; sepals 2–3 cm. long, lance-subulate, long-acuminate, light yellow, about 5 cm. long; outer filaments slightly dilated, the rest filiform, three fourths as long as the petals; petaloid staminodia none; capsule 4 cm. long, 1 cm. thick; seeds obovate, winged.

This species has been confused with *N. laevicaulis* (Hook.) Greene, but differs in the pubescent, duller stem (in *N. laevicaulis* this is glabrous or with a few scattered stiff hairs, very white and shining), broader petals, more deeply divided upper stem-leaves, which are characterized by their acumination and broad almost subhastate bases. *N. acuminata* extends farther eastward and northward than *N. laevicaulis* and is lacking in California.

IDAHO: Spokane River, Kootenai County, 1892, *Sandberg, MacDougal & Heller 651* (type, in herb. N. Y. Bot. Gard.); Palouse County and Lake Coeur d'Alene, *Aiton 6015*.

MONTANA: Emigrant Gulch, 1897, *Rydberg & Bessey 4546;* Sedan, 1902, *W. W. Jones;* Garrison, 1895, *Rydberg 2737*, and *C. L. Shear 5248;* Helena, 1892, *Kelsey*.

WYOMING: Between Sheridan and Buffalo, 1900, *Tweedy 3617;* Gardiner River, 1899, *Aven Nelson & Elias Nelson 6000*.

UTAH: City Creek, 1883, *Leonard 116 and 227;* Beck's Hot Spring, 1905, *Garrett 1595;* Antelope Island and Stansbury Island, *Stansbury*.

WASHINGTON: Loon Lake, 1897, *Winston;* Spokane, 1902, *Kraeger 529*.

ONAGRACEAE

Boisduvalia salicina (Nutt.) Rydb.

Oenothera densiflora β T. & G. Fl. N. Am. 1: 505. 1840.
Oenothera salicina Nutt. in T. & G. *loc. cit.*, as a synonym.

This is quite different in habit from the typical *B. densiflora* (Lindl.) S. Wats., having the foliage-leaves narrow, linear or linear-lanceolate. It has a much more northern and eastern range, extending into British Columbia and Idaho.

Epilobium latiusculum Rydb. sp. nov.

Epilobium Drummondii latiusculum Rydb. Mem. N. Y. Bot. Gard. 1: 276. 1900.

To the characters given in the original description may be added that the leaves are distinctly petioled, not sessile as in *E. Drummondii.*

Epilobium platyphyllum Rydb. sp. nov.

Epilobium glaberrimum latifolium Barbey, Bot. Calif. 1: 220. 1876. Not *E. latifolium* L. 1753.

Epilobium paniculatum, as usually understood, contains several forms or species, connecting on one hand with *E. minutum*, on the other with *E. jucundum.* In order to facilitate the further study of the groups, I give the following key of the Rocky Mountain forms.

Tube of the hypanthium funnelform, 1–3 mm. (rarely 4 mm.) long.
- Petals white only slightly exceeding the calyx, 2–3 mm. long; capsule glabrous; tube of hypanthium 1–1.5 mm. long. — 1. *E. Tracyi.*
- Petals pink or purple, 3.5–7 mm. long, about twice as long as the calyx.
  - Capsule and pedicels glabrous or sparingly puberulent.
    - Leaves and bracts very thick, horny at the apex, the latter very short; capsule glabrous; pedicels short. — 2. *E. subulatum.*
    - Leaves and bracts not very thick, not horny at the apex; capsule usually puberulent, at least when young; pedicels slender. — 3. *E. paniculatum.*
  - Capsule and pedicels glandular-pubescent; pedicels very short. — 4. *E. adenocladum.*

Tube of the hypanthium 4–8 mm. long, cylindric or nearly so, abruptly widening into the calyx.
- Tube of the hypanthium about 4 mm. long; petals 6-7 mm. long. — 5. *E. laevicaule.*
- Tube of the hypanthium 7–8 mm. long; petals 10–12 mm. long. — 6. *E. Hammondii.*

Epilobium Tracyi Rydb. sp. nov.

Annual; stem 3–8 dm. high, perfectly glabrous, straw-colored; leaves 2–4 cm. long, linear, entire, glabrous; tube of the hypanthium 1–1.5 mm. long, funnelform; calyx-lobes about 2 mm. long, very acute; petals white, 2–3 mm. long; capsule more or less

clavate, about 1.5 cm. long, perfectly glabrous; seeds obovoid, 1.5 mm. long.

This species is related to *E. paniculatum* but differs in the small white flowers and the perfectly glabrous pod.

UTAH: Ogden, July 31, 1887, *Tracy & Evans 547* (type, in herb. N. Y. Bot. Gard.); Salt Lake City, May 1869, *Watson 396*.

OREGON: Washington County, July 4, 1894, *F. E. Lloyd*.

WASHINGTON: Spokane, July 11, 1902, *Kraeger 152*.

IDAHO: Little Potlatch River, Latah County, June 17, 1892, *Sandberg, MacDougal & Heller 477*.

MONTANA: Moraine near Polson, August 18, 1901, *Umbach*.

BRITISH COLUMBIA: Howser Lake, Selkirk Mts., June 17, 1905, *Charles H. Shaw 714*.

NEVADA: Huntington Valley, August 1868, *Watson 396*.

Epilobium subulatum (Haussk.) Rydb.

Epilobium paniculatum subulata Haussk. Monog. Epil. 247. 1884.

Epilobium laevicaule Rydb. sp. nov.

Annual; stem glabrous, 6–10 dm. high, glabrous and shining; the bark of the lower portion flaky; leaves linear or linear-lanceolate, 3–6 cm. long; the upper mostly involute, usually entire; tube of the hypanthium about 4 mm. long, rather abruptly widening into the calyx; calyx-lobes 3–4 mm. long; petals rose-colored, 6–7 mm. long; pods clavate, about 3 cm. long, glabrous or almost so; seeds obovoid, dark; coma dingy.

MONTANA: Manhattan, 1895, *Rydberg 2728* (type, in herb. N. Y. Bot. Gard.); *Shear 3114;* Big Fork, Aug. 3, 1909, *Butler 7016*.

WASHINGTON: Pullman, Aug. 5, 1893, *Piper 1631;* Spokane, Sept. 1902, *Kraeger 536* and *573*.

IDAHO: Palouse County, 1892, *G. B. Aiton 69;* Seven Devils Mountains, Aug. 5, 1899, *M. E. Jones 6317*.

Epilobium Sandbergii Rydb. sp. nov.

Perennial by means of turions; stem obtusely angled, 6–10 dm. high, finely puberulent throughout; leaves sessile, ovate, acute, dentate, 3–7 cm. long, pubescent on both sides, or glabrate beneath, except the veins; inflorescence crisp-hairy; calyx-lobes linear-lanceolate, about 5 mm. long; petals rose, 7–8 mm. long; pod 4–6 cm. long, glandular-pilose; seeds 1.5 mm. long, almost beakless; coma tawny.

It resembles somewhat *E. Palmeri*, but the flowers are nearly twice as large.

IDAHO: Moist places, valley of Mud Lake, Kootenai County, July 25, 1892, *Sandberg, MacDougal & Heller 737* (type, in herb. N. Y. Bot. Gard.).

MONTANA: Bozeman, July 22, 1895, *Rydberg 2729*.

Gayophytum Helleri Rydb. sp. nov.

Annual; stem branched with nearly erect, strict branches, 1–3 dm. high, more or less pubescent with spreading hairs; leaves linear, 0.5–2 cm. long, softly hirsutulous; pedicels very short, even in fruit scarcely more than 1 mm. long; sepals and petals scarcely 1 mm. long; capsules linear, erect, 8–10 mm. long, almost sessile, hirsutulous, not torulose; seeds about 1 mm. long, strigulose.

This resembles *G. racemosum* in habit and the pod, *G. caesiun* in pubescence and *G. lasiospermum* in the seeds.

IDAHO: Forest, Nez Perces County, July 16, 1896, *Heller 3433* (type, in herb. N. Y. Bot. Gard.).

Anogra leptophylla (Nutt.) Rydb.

Oenothera pallida leptophylla (Nutt.) T. & G. Fl. N. Am. 1: 495. 1840.

Oenothera leptophylla Nutt.; T. & G. Fl. *loc. cit.*, as a synonym.

Oenothera longissima Rydb. sp. nov.

A tall biennial; stem strict, 5–10 dm. high, densely canescent with short crinkled hairs as well as sparingly hirsute; leaves linear or narrowly linear-lanceolate, 1–1.5 dm. long, densely canescent, entire, acute at both ends, the lower short-petioled; spike rather lax; bracts linear-lanceolate, 2–5 cm. long; hypanthium tube 10–12 cm. long, densely canescent, only slightly widening upwards; sepals linear-lanceolate, about 4 cm. long; free tips about 4 mm. long; petals golden yellow, 4 cm. long; stamens and pistil of about the same length; capsule about 4 cm. long, densely canescent, slightly tapering upwards.

This is related to *O. macrosceles* A. Gray and *O. Jamesii* T. & G., but differs from the former in being canescent instead of glabrous and in the smaller and narrower bracts, and from the latter in the longer, narrower and entire-margined leaves, and in being more canescent and less hirsute. It grows on sandy river banks at an altitude of about 1,600 m.

UTAH: Armstrong and White Canyons near the Natural Bridges, Aug. 4–6, 1911, *Rybderg & Garrett 9410* (type, in herb. N. Y. Bot. Gard.).

Oenothera ornata (A. Nelson) Rydb.

Onagra ornata A. Nels. Bot. Gaz. **52**: 268. 1911.

Oenothera hirsutissima (A. Gray) Rydb.

Oenothera biennis hirsutissima A. Gray, Mem. Am. Acad. **4**. 43. 1849.

This usually has been regarded as the same as *O. Hookeri* T. & G. The type of the latter came from California, that of the former from New Mexico. In the plant common in California and the Great Basin, the free tips of the sepals are about 4 mm. long, the pubescence of the leaves is short and that of the calyx not very copious. In the type of *O. biennis hirsutissima* and other specimens from New Mexico and Colorado, the free tips of the sepals are only 2–2.5 mm. long, the pubescence of the leaves and calyx long and loose, and that of the latter very copious.

Oenothera subulifera (Rydb.)

Onagra strigosa subulata Rydb. Mem. N. Y. Bot. Gard. **1**: 279. 1900. Not *O. subulata* R. & P. 1802

Onagra Oakesiana Rydb. Fl. Colo. 244. 1906. Not *Oenothera Oakesiana* A. Gray. 1867.

Chylisma tenuissima (M. E. Jones) Rydb.

Oenothera tenuissima M. E. Jones, Proc. Calif. Acad. II. **5**: 683. 1895.

Sphaerostigma macrophyllum (Small) Rydb.

Oenothera alyssoides villosa S. Wats. Proc. Am. Acad. **8**: 591. 1873. Not *O. villosa* Thunb. 1794–1800.

Sphaerostigma alyssoides macrophyllum Small, Bull. Torrey Club **23**: 192. 1896.

AMMIACEAE

Osmorrhiza intermedia Rydb.

Washingtonia intermedia Rydb. Mem. N. Y. Bot. Gard. **1**: 289. 1900.

Glycosma maxima Rydb. sp. nov.

Perennial; stem 1 m. high or more, puberulent or glabrous, pilose at the nodes; lower leaves twice compound, first pinnate and the lower primary divisions ternate; the upper leaves ternate or twice ternate; leaflets oblong-lanceolate, 5–10 cm. long, minutely puberulent; branches of the umbels 9–12, in fruit more or less spreading; pedicels in fruit 1–1.5 cm. long; fruit fully 2 cm. long, obtuse at the base, contracted above into a beak 2 mm. long; stylopodium conical, 0.5 mm. long, about as long as the styles.

This is related to *G. occidentalis* Nutt., but the fruit is much larger (in *G. occidentalis* only 12–16 mm., rarely 18 mm. long), and the rays of the umbels are in fruit usually widely spreading, while in *G. occidentalis* they are nearly erect. The spreading rays suggest *G. ambigua* and *G. Bolanderi*, but in both these species the stylopodium is flatter.

UTAH: Mount Nebo, Aug. 15, 1905, *Rydberg & Carlton 7585* (type, in herb. N. Y. Bot. Gard.); Rocky Canyon, Provo, Aug. 16, 1887, *Tracy 684*.

MONTANA: Midvale, July 24, 1903, *Umbach 508*.

ATENIA H. & A. Bot. Beech. Voy. 349. 1840

This I think is a good genus, distinct from *Carum*. Although the fruit is almost the same, the habit is quite different. The habit of *Atenia* is the same as that of *Eulophus*. In fact it is hard to distinguish the two genera without mature fruit, both having the fascicled tuberous roots, the narrow leaf-segments, the same inflorescence and flowers. The only essential differences are the deeply concave seed-face with a central ridge and the several oil tubes in *Eulophus* and the plane face and solitary oil tubes in *Ataenia*. The following species are found in the Rocky Mountains:

ATENIA GAIRDNERI H. & A. Bot. Beech. Voy. 349. 1840

Edosmia Gairdneri Nutt.; T. & G. Fl. N. Am. 1: 612. 1840.
Carum Gairdneri A. Gray, Proc. Am. Acad. 7: 344. 1867.

Atenia montana (Blank.) Rydb.

Carum montanum Blank. Mont. Agr. Coll. Sci. Bot. 1: 91. 1905.

Atenia Garrettii (A. Nels.) Rydb.

Carum Garrettii A. Nels. in Rose, Cont. U. S. Nat. Herb. **12**: 443. 1909.

Oreoxis MacDougali (C. & R.) Rydb.

Aletes MacDougali C. & R. Cont. U. S. Nat. Herb. **7**: 107. 1900.

This was doubtfully referred to *Aletes* by Coulter and Rose. The fruits in the type collection were very young and did not show their true nature. Anyhow, they showed distinct wings, a character inconsistent with the genus *Aletes*. Professor Garrett and myself collected good fruits in southeastern Utah in the summer of 1911; and these show that the plant is rather an *Oreoxis* than an *Aletes*, wings being present and these thick and corky. The two genera are, however, more closely related than has been recognized, having the same cespitose habit, the prominent calyx, teeth, etc.

Daucophyllum (Nutt.) Rydb. gen. nov.

Musenium § *Daucophyllum* Nutt.; T. & G. Fl. N. Am. **1**: 642. 1840.

Low cespitose perennials, acaulescent or nearly so, with a branched caudex. Leaves numerous, basal, or 1 or 2 cauline, pinnate or bipinnate with filiform or narrowly linear divisions. Flowers cream-colored to yellow, in dense umbels. Bracts wanting; bractlets few, narrow, linear. Calyx teeth prominent. Stylopodium wanting. Fruit ovoid or oblong, granular on the intervals. Ribs equal, rather strong, but not at all winged. Oil tubes 2 or 3 in the intervals, 4–6 on the commissural side. Seed terete or somewhat depressed; face plane.

The type, *Musenium tenuifolium* Nutt., was separated as a section in Torrey and Gray's Flora. The relationship is rather with *Harbouria* and *Aletes* than with *Musineon* Raf. The first-mentioned relationship was recognized by Coulter and Rose (see their Revision, p. 111). It differs from *Harbouria* in not having thick corky ribs and in having several oil tubes in the intervals. It is still more closely related to *Aletes*, having the same habit, although narrower leaf-segments, the main differences being, however, the solitary oil tubes in *Aletes* and 2 or 3 in each interval in *Daucophyllum*, and the concave seed face in the former and the plane

one in the latter. The second species given below was included questionably in *Aletes* by Coulter and Rose; but in the number of oil tubes and the plane seed face it agrees better with *Musenium tenuifolium* Nutt. than with the typical species of *Aletes*.

Leaves bipinnate; segments filiform; bractlets not exceeding the pedicels; seed subterete. 1. *D. tenuifolium.*

Leaves pinnate; segments narrowly linear; bractlets longer than the pedicels; seeds somewhat depressed. 2. *D. lineare.*

1. **Daucophyllum tenuifolium** (Nutt.) Rydb.

Musenium tenuifolium Nutt.; T. & G. Fl. N. Am. **1**: 642. 1840.

2. **Daucophyllum lineare** Rydb. nom. nov.

Aletes tenuifolia C. & R. Cont. U. S. Nat. Herb. **7**: 108. 1900.

Coriophyllus (M. E. Jones) Rydb. gen. nov.

Cymopterus §*Coriophyllus* M. E. Jones, Cont. West. Bot. **12**: 20. 1908.

Perennial herbs with more or less fleshy root, somewhat branched rootstock covered with fibrous sheaths, and leafy stems with internodes shorter than the leaf-sheaths. Flowers yellow to purple. Bracts none; bractlets present, but narrow. Leaves pinnately dissected, subcoriaceous, rigid, not fleshy, with ovate or lanceolate, cuspidate or spinulose-tipped lobes. Calyx teeth evident. Stylopodium wanting. Fruit orbicular to oval in outline, usually emarginate at both ends, compressed laterally if at all. Ribs with broad wings. Oil tubes 1–5 in the intervals, 2–8 on the commissural side. Seeds little if at all flattened dorsally; face deeply grooved.

I agree with Mr. Marcus E. Jones that the genus *Aulospermum*, as constituted by Coulter and Rose, is a rather unnatural one, made up of two groups of quite different habit; but instead of reducing both groups to sections of *Cymopterus* as Mr. Jones did, I rather regard them as two distinct genera, and adopt for the second group the sectional name first proposed by Mr. Jones. (See the discussion in Cont. West. Bot. **12**: 19–20 and 27.) He, however, had the group under two different sectional names. The section is called *Coriophyllus* on page 20 and *Scopulicola* on page 27.

The following species are found in the Rockies and are distinguished thus:

Wings thickened at the insertion.
- Leaves ternately bipinnatifid; oil tubes solitary in each interval. 1. *C. Jonesii.*
- Leaves pinnate, with lobed or divided leaflets; oil tubes several in each interval. 2. *C. Rosei.*

Wings not thickened at the insertion.
- Flowers purplish; oil tubes 8 on the commissural side. 3. *C. purpureus.*
- Flowers greenish-yellow; oil tubes 4 on the commissural side. 4. *C. Betheli.*

1. **Coriophyllus Jonesii** (C. & R.) Rydb.

Cymopterus Jonesii C. & R. Rev. N. Am. Umb. 80. 1888.
Aulospermum Jonesii C. & R. Cont. U. S. Nat. Herb. **7**: 178. 1900.

2. **Coriophyllus Rosei** (M. E. Jones) Rydb.

Aulospermum Rosei M. E. Jones; C. & R. Cont. U. S. Nat. Herb. **7**: 179. 1900.

3. **Coriophyllus purpureus** (S. Wats.)

Cymopterus purpureus S. Wats. Am. Nat. **7**: 300. 1872.
Aulospermum purpureum C. & R. Cont. U. S. Nat. Herb. **7**: 178. 1900.

4. **Coriophyllus Betheli** (Osterhout) Rydb.

Aulospermum Betheli Osterhout, Muhlenbergia **6**: 46. 1910.

PSEUDOCYMOPTERUS C. & R.

This genus is one of the most unnatural in Coulter & Rose's Monograph. Jones* called attention to this fact, although he included the genus, as well as *Oreoxys*, *Rhysopterus*, *Aulospermum*, and *Pteryxia* in *Cymopterus*, and does not go to the bottom of the facts. The genus as constituted by Coulter and Rose contains at least three distinct groups of plants of little relationship to each other. The first group contains *Pseudocymopterus montanus* and its close relatives; the second of *P. anisatus* and *P. aletifolius*, and perhaps *P. Hendersonii*, which I do not know; and the third of *P. bipinnatus* and probably *Cymopterus nivalis* S. Wats., of which the fruit is unknown. *P. montanus* is the type of the genus, which latter therefore must be restricted to it and its relatives. Jones

* Cont. West. Bot. **12**: 24–29. 1908.

includes *P. anisatus* and *P. bipinnatus* in his section *Oreoxis*, but the genus *Oreoxis* has all ribs corky and the lateral ones scarcely more prominent than the dorsal ones, the fruit is not flattened dorsally, the styles and sepals are erect. In *Pseudocymopterus anisatus* the lateral wings are very prominent, the dorsal ribs narrowly winged or some of them merely acute, the styles are recurved, the sepals spreading and one or two of them larger than the rest, and the fruit is decidedly flattened dorsally. The plant is more related to *Aletes* than to *Oreoxis*, and *P. aletifolius* connects it with that genus. It can not be placed in *Aletes*, however, for in that genus the fruit is not compressed and the ribs not winged. It would be much better to include *P. anisatus* and *P. aletifolius* in *Pteryxia*, as they have the foliage and nearly the same fruit as in that genus, but the strictly acaulescent plant, the narrow and thick wings of the fruit and the very prominent and unequal calyx-teeth would make it rather abnormal even in that genus. Although it does not differ so much in the technical characters of the fruit from the typical *Pseudocymopterus*, the habit is quite different, so also the texture of the leaves, and in *Pseudocymopterus* the sepals are minute. It is better to regard *P. anisatus* as a type of a new genus.

Pseudopteryxia Rydb. gen. nov.

Densely cespitose, strong-scented, acaulescent perennials with multicipital caudices covered with numerous sheaths of old leaves. Leaves pinnatifid or bipinnatifid with thick, firm, pungent divisions. Flowers yellow; involucres wanting; bractlets linear-subulate, pungent. Calyx-teeth very prominent, spreading, unequal, one or two much longer than the rest. Stylopodium wanting. Fruit oblong, glabrous. Ribs thick, the dorsal and intermediate ones sharp or some of them with narrow wings; the lateral ones with broader wings, distinct from those of the other carpel. Carpels flattened dorsally. Oil tubes 1–3 in the intervals, 2–4 on the commissural side. Seed face plane.

Pseudopteryxia anisata (A. Gray) Rydb.

Cymopterus (?) *anisatus* A. Gray, Proc. Acad. Phila. 1862: 63. 1863.

Pseudocymopterus anisatus C. & R. Rev. N. Am. Umb. 75. 1888.

Pseudopteryxia longiloba Rydb. sp. nov.

Densely cespitose perennial with a thick root and short caudex, covered by numerous old leaf-sheaths and petioles; leaves twice pinnatifid, with linear-subulate, pungent divisions; peduncles 2–3 dm. high, stout; bractlets linear-subulate, spreading, often 1 cm. long; flowers yellow; fruit about 6 mm. long; lateral wings thick, narrow, some of the wings of the dorsal ribs often fully as broad; calyx-teeth less prominent than in *P. anisata*.

This is closely related to *P. anisata*, differing in the larger fruit (in *P. anisata* about 4 mm. long), and longer leaf-segments. On account of the long leaf-segments, specimens collected in flower by Carlton and myself were mistaken for *Cynomarathrum Nuttallii* (A. Gray) C. & R.; but good fruit was received in the summer of 1911.

UTAH: Abajo Mountains, Aug. 17, 1911, *Rydberg & Garrett 9761* (fruit; type, in herb. N. Y. Bot. Gard.); also *9760* (fruit); La Sal Mountains, July 7 and 17, *8724* and *9015* (young fruit); Mountains north of Bullion Creek, near Marysvale, July 23, *Rydberg & Carlton 7085* and *7096* (flowers); Mount Ellen, July 24 and 25, 1894, *M. E. Jones 5677* (fruit, but poor).

Pseudopteryxia aletifolia Rydb.

Pseudocymopterus aletifolius Rydb. Bull. Torrey Club 31: 574. 1904.

Neither can *Pseudocymopterus bipinnatus* be retained in the genus; in fact, it is still more out of place. Not only is the habit strikingly different from that of *P. montanus*, but the fruit is not, as Coulter and Rose described it, "moderately flattened dorsally," for the fruit when well developed is moderately flattened laterally, which places it in the other division of the family. Furthermore, the seed face is concave, the bractlets broad and scarious, and a stylopodium, although strongly flattened, is present. Were it not for these characters of the fruit the plant could be placed in the same genus as *P. anisatus*. As it is, its relationship is with *Daucophyllum* and *Aletes*. I would place it in *Daucophyllum* were it not for the winged ribs, the concave seed face and the reflexed style. The fruit is nearer that of *Aletes*, but the oil tubes are several, the ribs winged, styles reflexed and stylopodium present. If a person were using the key given by Coulter and Rose

in their Monograph and were trying to determine the plant, the key would lead to *Aulospermum* or *Phellopterus*, to either of which genera it is not even closely related. Mr. Jones included it in *Oreoxis*, to which I admit it is related, but the ribs are not corky, the stylopodium present, the styles reflexed, the flowers white, not yellow, and the bractlets scarious.

Pseudoreoxis Rydb. gen. nov.

Low cespitose acaulescent perennials, with branched caudex. Leaves bipinnate; the segments more or less cleft with small lanceolate divisions. Flowers white in small umbels; bracts wanting; bractlets ovate or lanceolate, cuspidate or abruptly acuminate, scarious, white with a green midrib. Calyx-teeth evident but small. Stylopodium present but low and flat. Styles reflexed. Fruit somewhat flattened laterally, oblong. Ribs all with narrow wings, the lateral ones scarcely wider. Oil tubes 3 or 4 in the intervals, 6–8 on the commissure. Seed face slightly concave.

Pseudoreoxis bipinnatus (S. Wats.) Rydb.

Cymopterus bipinnatus S. Wats. Proc. Am. Acad. **20**: 368. 1885.
Pseudocymopterus bipinnatus C. & R. Rev. N. Am. Umbel. 75. 1888.

Pseudoreoxis nivalis (S. Wats.) Rydb.

Cymopterus nivalis S. Wats. Bot. King. Exped. 123. 1871.

I do not hesitate to refer this species to the same genus as *P. bipinnatus*, although the fruit is unknown, for the habit, and flowers are so closely resembling those of *P. bipinnatus*.

Cynomarathrum latilobum Rydb. sp. nov.

Acaulescent perennial with densely cespitose caudex covered by old broad leaf-sheaths; leaves about 1 cm. long, pinnate, glabrous; leaflets entire or 2- or 3-cleft into broadly lanceolate, reticulate, thick, pointed segments 5–15 mm. long; peduncles 1–1.5 dm. long, stout; rays 1–2 cm. long; bractlets linear or lance-linear, 5–6 mm. long; flowers apparently straw-colored or ochroleucous; fruit about 9 mm. long, 6 mm. wide; lateral wings about as broad as the body; dorsal ribs filiform or some of them narrowly winged; oil tubes 2–4 in the intervals, 4–6 on the commissure, rather obscure.

The fruit of this species is intermediate between that of *C. Nuttallii* and *C. Parryi*, but the plant differs from both, as well as from all the known species, in the broad segments of the leaves.

The segments resemble those of some species of *Cogswellia* of the *C. triternata* group, but the leaves are pinnate, not ternate, the plant has the densely cespitose, sheath-covered caudex characteristic of *Cynomarathrum*, and the fruit is of that genus, having some of the dorsal ribs winged, and the calyx-teeth are prominent. It grows on sides of canyons at an altitude of 1,600 m.

UTAH: Proposed dam site, near Wilson Mesa, Grand County, Utah, July 1, 1911, *Rydberg & Garrett 8371* (fruit; type, in herb. N. Y. Bot. Gard.); also *8414* (withered flowers).

Cogswellia simplex (Nutt.) Rydb.

Peucedanum triternatum platycarpum Torr. Stansb. Rep. 389. 1852.
Peucedanum simplex Nutt.; S. Wats. Bot. King. Exped. 129. 1871.
Lomatium platycarpum C. & R. Cont. U. S. Nat. Herb. **7**: 226. 1900.
Cogswellia platycarpa (Torr.) M. E. Jones, Cont. West. Bot. **12**: 32. 1908.

It was unfortunate that an amendment to the Rochester Code ever was passed at Madison, by which a varietal name could supersede a specific name, and I am glad that the amendment mentioned has been recalled and that we can return to the specific name well known by a long usage.

Cogswellia leptophylla (Hook.) Rydb. sp. nov.

Peucedanum triternatum leptophyllum Hook. Lond. Journ. Bot. **6**: 235. 1847.

This species is related to *C. simplex*, *C. triternata*, and *C. robustior*. In general habit, it resembles most the second, but the leaflets are narrower, the fruit is shorter and relatively broader and puberulent. *C. simplex* has less compound leaves, broader leaflets, larger and glabrous fruit; *C. robustior* has much broader and more spreading leaflets, longer fruit with very narrow wing.

MONTANA: Helena, June–July, 1891, *Kelsey;* also May, 1890; University campus and hillsides, Missoula, 1901, *MacDougal 130;* Old Sentinel, June 12, 1901, *MacDougal;* Deer Lodge, June, 1888, *Traphagen;* Mt. Ascension, Helena, 1909, *Butler 4057*.

IDAHO: Hills near Boise, June 7, 1892, *Isabel Mulford;* Weiser, April 18, 1900, *M. E. Jones 6336*.

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